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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/714,020

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Warren P. Heim

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EXAMINER

RAMIREZ, JOHN FERNANDO

ART UNIT

PAPER NUMBER

3737

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/714,020

**Applicant(s)**

HEIM, WARREN P.

**Examiner**

JOHN F. RAMIREZ

**Art Unit**

3737

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 October 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☐ Claim(s) \_\_\_\_\_ is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☒ Claim(s) 12-26 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SG/US)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

Claims 27-58 and 62-95 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 10/20/08.

### ***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-26 and 59-61 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

On October 26, 2005, the USPTO published Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility. See:  
([http://www.uspto.gov/web/offices/pac/dapp/opla/preognotice/guidelines101\\_20051026.pdf](http://www.uspto.gov/web/offices/pac/dapp/opla/preognotice/guidelines101_20051026.pdf))

This guidelines details a procedure for determining patent eligible subject matter. As to claims 1 and 59, the first step in this process is whether the claims fall within one of enumerated categories. In the immediate application, the claims are drawn to a process and a system - a "medical signal processing method and a system" - and meets this step. However, the analysis does not end here. The next step is whether a judicial exception (abstract ideas, laws of nature, natural phenomenon) is provided in the claim.

In the immediate application, claims 1 and 59 clearly includes one of the judicial exceptions in that “receiving a time-based information corresponding...medical diagnostic signal” and the step of “performing a transform on the time-based information to obtain a frequency spectrum.....” are nothing more than abstract ideas. While abstract ideas alone are not eligible, the claim as a whole must be analyzed to determine whether it is for a particular application of the abstract idea. For claims including such excluded subject matter to be eligible, the claim must be for a practical application of the abstract idea, law of nature, or natural phenomena. To satisfy the requirement of a practical application, the claimed invention must:

(1) transform an article or physical object to a different state or thing; if no transformation, then

(2) the claimed invention must produce a useful, concrete, and tangible result.

Regarding (1) above, the claims do not provide a transformation or reduction of an article to a different state or thing. Grouping equivalent dipoles based on predetermined criterion and solving inverse problems clearly do not transform an article or physical object to a different state or thing. Accordingly, one must then consider whether the claimed invention produces a useful, concrete, **and** tangible result.

**(1) Useful Result**

For an invention to be “useful” it must satisfy the utility requirement of section 101. The USPTO’s official interpretation of the utility requirement provides that the utility of the invention has to be (i) specific, (ii) substantial and (iii) credible. See MPEP 2107. It can be argued that the claim does not provide a useful result in that the claim

does not actually solve a problem. It does not appear to be specific as to how the problem is solved and, if solved, it is not specific as to the use of this solution.

**(2) Tangible Result**

The tangible requirement does not necessarily mean that a claim must either be tied to a particular machine or apparatus or must operate to change articles or materials to a different state or thing. However, the tangible requirement does require that the claim must recite more than a 101 judicial exception, in that the process claim must set forth a practical application of that 101 judicial exception to produce a real world result.

Regarding the tangible result requirement, the claim clearly does not provide a practical application. The problem, even if solved, is not practically applied to produce a real world result. For example, once the problem is solved, how is this then applied?

**(3) Concrete Result**

Another consideration is whether the invention produces a “concrete” result. Usually, this question arises when a result cannot be assured. In other words, the process must have a result that can be substantially repeatable or the process must substantially produce the same result again. Resolving this question is dependent on the level of skill in the art. For example, if the claimed invention is for a process which requires a particular skill, to determine whether the process is substantially repeatable will necessarily require a determination of the level of skill of the ordinary skilled artisan.

Regarding the concrete result requirement, the claim does not provide a result that can be assured in that the result can not be substantially repeatable and the process can not substantially produce the same result again.

In view of the above analysis, applicant's claims 1 and 59, are a process and a system which includes a judicial exception therein. Upon review of the claim as a whole, there is no transformation nor does the claim produce a useful, concrete, and tangible result. Accordingly, the claims are non-statutory under 35 U.S.C. 101.

In relation to claims 2-26 and 60-61 depend from claims 1 and 59 respectively, and as such, include the various steps thereof. As discussed above, claim 1 is a method that provides no physical transformation and there is no practical application, which is useful, concrete and tangible. Accordingly, the claims are non-statutory.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5, 7-9, 11, 59-61 are rejected under 35 U.S.C. 102(b) as being anticipated by Scheib et al. (US 5,628,321).

Scheib et al. disclose a medical signal processing method and system, comprising the steps of: receiving time-based information corresponding to a defined time interval of a time-based, medical diagnostic signal (see abstract); performing a transform on the time-based information to obtain a frequency spectrum (abstract, col. 2, lines 12-30) defined by a set of nonzero amplitude values for a corresponding set of frequencies (col. 4, lines 1-25), the frequency spectrum including a number of the

nonzero amplitude values at irregularly spaced frequency intervals (see Figs. 3, 5A and related description), wherein the nonzero amplitude values include a first nonzero amplitude value at a first frequency value and a second nonzero amplitude value greater than the first nonzero amplitude value at a second frequency and the second frequency is a noninteger multiple of each frequency of the set of frequencies other than the second frequency; and operating a processor in a signal processing environment for using the transform to provide an output based on the time-based, medical diagnostic signal (see Fig. 2A, col. 5, lines 50-67, col. 4, lines 55-67, col. 5, lines 1-48), the time-based signal includes a component having a period that is longer than the time interval (abstract, col. 3, line 63 - col. 4, line 6), obtaining an input based on a transmitted ultrasound signal (abstract), and using the spectrum to calculate at least one parameter based on the time-based signal (vascular measurements, cardiac cycle and velocity) (see claims 1 and 2 and abstract), In figures 3, 5A and 8 Scheib et al. disclose that the spectrum defines a substantially continuous function across a frequency range wherein the function has nonzero values for a majority of frequencies of the range. Scheib et al. disclose in Figs. 2A-2B and 8 that the time-based signal is an analog signal and the time-based information is digital time-based information, and the step of performing a transform involves accounting for a digitization error associated with a difference between the analog time-based signal and the digital time-based information (col. 4, lines 55-67, col. 5, lines 1-48; col. 9, lines 1-23).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scheib et al. (US 5,628,321) in view of non-patent literature Jean-Yves "*Modem Spectral Analysis Techniques for Blood Flow Velocity and Spectral Measurements with Pulsed Doppler Ultrasound*".

Scheib et al. disclose a medical signal processing method and system as describe above. However, it appears that Scheib et al. does not explicitly disclose that the spectrum includes first, second and third successive nonzero values associated with first, second and third successive frequencies, where a difference between the first and second frequencies is different than a difference between the second and third frequencies, using the spectrum to modify the time-based signal on a frequency dependent basis, and the time-based signal is an ultrasound signal modulated based on interaction with tissue of an organism including a flow channel and the step of operating comprises determining dimension related information for the flow channel.

In the same field of endeavor, Jean-Yves teaches or suggest spectral analysis techniques applied to pulsed Doppler ultrasonic signals for estimation of flow velocity and Doppler spectra, including first, second and third successive nonzero values associated with first, second and third successive frequencies, where a difference



between the first and second frequencies is different than a difference between the second and third frequencies, using the spectrum to modify the time-based signal on a frequency dependent basis, and the time-based signal is an ultrasound signal modulated based on interaction with tissue of an organism including a flow channel and the step of operating comprises determining dimension related information for the flow channel (see abstract, see section methods, see pages 592-593 and figs. 3-5).

Based on the above observations, for a person of ordinary skill in the art, modifying the method disclose by Scheib et al., with the above discussed enhancements would have been considered obvious because such modifications would have a great effect upon image quality and measurement results in order to derive reliable diagnostic criteria.

### ***Allowable Subject Matter***

Claims 12-26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHN F. RAMIREZ whose telephone number is (571)272-8685. The examiner can normally be reached on (Mon-Fri) 7:00 - 3:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian L. Casler can be reached on (571) 272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. F. R./  
Examiner, Art Unit 3737

/Long V Le/  
Supervisory Patent Examiner, Art Unit 3768